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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/910,662	07/20/2001	Ziya Aral	61628-05744	2628

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EXAMINER	
TRAN, NGHI V	
ART UNIT	**PAPER NUMBER**
2151	

DATE MAILED: 12/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/910,662	ARAL ET AL.	
	Examiner	Art Unit	
	Nghi V. Tran	2151	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 October 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 11, 2005 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-6, 9-11, 18-21, 23, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yanai et al., U.S. Patent No 6,502,205 (hereinafter Yanai), in view of McDowell, U.S. Patent No. 6,260,125 (hereinafter McDowell).

4. With respect to claims 1, 3, and 5, Yanai teaches a system for mirroring write operations from a local storage system onto a remote storage system [see abstract and figs.1-4], the system comprising:

- an asynchronous mirroring driver resident in the local storage system for intercepting I/O transactions to a storage disk of the local storage system, identifying a series of write transactions issued to said storage disk, making a copy of the series of write transactions, and storing said copy in at least on of a series of files that are created on a file-system of the local storage system [col.3, ln.55 - col.4, ln.25 and col.5, lns.19-67]; and
- a first asynchronous mirroring coordinator [12 i.e. host A] resident on the local storage system for invoking a file transfer system to transmit the series of files on local file-system of the local storage system to a file system of the remote storage system via a non-proprietary network protocol [fig.1 and col.19, ln.65 - col.20, ln.64].

However, Yanai does not explicitly show to accommodate an exact reproduction at the remote storage system of the series of write transactions as issued to said storage disk of the local storage system.

In asynchronous remote data mirroring system, McDowell suggests to accommodate an exact reproduction at the remote storage system of the series of write transactions as issued to said storage disk of the local storage system (i.e. non-mirrored volume) [col.4, ln.40 - col.5, ln.24].

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Yanai in view of McDowell by accommodating an exact reproduction at the remote storage system of the series of write transactions as issued to said storage disk of the local storage system because this feature provides for log-based mirror reconstruction and check-pointing of the mirrored volumes [McDowell, see abstract]. It is for this reason that one of ordinary skill in the art at the time of the invention would have been motivated in order to optimize the queuing process for write locality, i.e. minimizing duplicated writes [McDowell, col.5, lns.55-60].

5. With respect to claims 2,4 and 6, Yanai further teaches the system claim 1 further comprising:

- a second asynchronous mirroring coordinator [52 i.e. host B] resident on the remote storage system for detecting the series of files on the file system of the remote storage system, opening the files and reading the copies of the series of write transactions in these files [fig.1]; and
- an asynchronous mirroring driver resident on the remote storage system for receiving the copies of the series of write transactions from the second asynchronous mirroring coordinator and issuing the transactions to a remote device connected tot the remote storage system which is configured to mirror the local storage device on the local storage system [col.3, ln.55 - col.4, ln.25 and col.5, lns.19-67].

6. With respect to claims 9-11, Yanai further teaches the asynchronous mirroring driver intercepts all I/O transactions in the system [36 i.e. disk adaptor].

7. With respect to claims 18-20, Yanai further teaches the asynchronous mirroring driver intercepts a transaction affecting the content or organization of a disk [col.20, ln.41 - col.21, ln.38].

8. With respect to claims 21, 23, and 25, Yanai further teaches the series of write transactions is one of the plurality of series of I/O transactions that are respectively retained in corresponding ones of the series of files, and individual ones of the series of files include pointers to accommodate sequencing the series of files, whereby a transaction level record of changes to the storage disk of the local storage system is provided for the remote storage system [col.21, ln.40 - col.22, ln.40 and col.23, ln.45 - col.24, ln.62].

9. With respect to claims 22, 24, and 26, Yanai further teaches the plurality of series of I/O transactions include at least one formatting transactions and/or at least one partitioning transaction [col.5, lns.19-67].

10. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over both Yanai and McDowell as applied to claims 1, 3, and 5 above, and further in view of Cannon et al., U.S. Patent No. 5,673,382 (hereinafter Cannon).

11. With respect to claim 7, Yanai is silent on individual ones of the series of the files comprise: a Header portion that includes information on the total size of the file; an I/O Control Block portion which indicates address offsets where each transaction in the file is to be stored on the remotely located destination storage system, and which further indicates the size of the data for each transaction; and a Data portion which contains the data for each transaction in the file.

In a communication system, Cannon discloses individual ones of the series of the files comprise:

- a Header portion that includes information on the total size of the file [col.8, lns.44-46];
- an I/O Control Block portion which indicates address offsets where each transaction in the file is to be stored on the remotely located destination storage system, and which further indicates the size of the data for each transaction [col.8, lns.43-44]; and
- a Data portion which contains the data for each transaction in the file [col.8, lns.41-46].

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify both Yanai and McDowell, and further in view of Cannon by including a Header portion on the total size, indicating an I/O Control Block portion, and containing a Data portion for each transaction in the file because this feature keeps track of each transaction (i.e. the size of the file, the size of data for each

transaction and the data portion). It is for this reason that one of ordinary skill in the art at the time of the invention would have been motivated to modify in order to provide disaster recovery [Cannon, see abstract].

12. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over all Yanai, McDowell, and Cannon as applied to claim 7 above, and further in view of Durflinger et al., U.S. Patent No. 5,713,014 (hereinafter Durflinger).

13. With respect to claim 8, both Yanai and Cannon are silent on the Header portion further includes: a pointer to the I/O Control Block portion which indicates the offset where the I/O Control Block portion of the file begins; and a pointer to the Data portion, which indicates the offset where the Data portion of the file begins.

In a communication system, Durflinger discloses the Header portion further includes: a pointer to the I/O Control Block portion which indicates the offset where the I/O Control Block portion of the file begins; and a pointer to the Data portion, which indicates the offset where the Data portion of the file begins [col.11, lns.13-37].

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify all Yanai, McDowell, and Cannon, and further in view of Durflinger by indicating the I/O Control Block and Data portion of the file begins because this feature indicate where the I/O control block portion begins in the file and where the data begins in the file. It is for this reason that one of ordinary skill in the

art at the time of the invention would have been motivated to modify both Yanai and Cannon, and further in view of Durflinger in order to access the files easier.

Response to Arguments

14. Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nghi V. Tran whose telephone number is (571) 272-4067. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zarni Maung can be reached on (571) 272-3939. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Khanh Tran
A. U. 2151
Primary Examiner

Nghi V Tran